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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,513	03/10/2004	Brian S. Higgins	7340-011	4226

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EXAMINER

COCKS, JOSIAH C

ART UNIT	PAPER NUMBER
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3749

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/797,513

Applicant(s)

HIGGINS, BRIAN S.

Examiner

Josiah Cocks

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 17-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 17-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Receipt of applicant's amendment filed 11/02/2006 is acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-8** are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,824,441 to Kindig ("Kindig").

Kindig discloses a method in the same field of endeavor as applicant's invention and as described in applicant's claims 1-8. In particular, Kindig describes a method of reducing the acidity of flue gas (e.g. NO_x and SO₃, see abstract) and lowering the temperature of the flue gas (see at least abstract and col. 6, lines 14-19, and col. 14, lines 45-54); partially combusting the fuel in a first state to create a reducing environment (see at least col. 6, lines 4-14 and col. 10, lines 51-54); maintaining the reducing environment for a sufficient time period such that reducible acids are reduced to achieve a desirable acidity concentration in the flue gas (see at least col. 12, line 54 through col. 13, line 23, note particularly equation 7); combusting the remainder of the fuel and combustion intermediates in a second stage with oxidizing

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environment in order to decrease the acidity of the flue gas by reducing the acid concentration of the gas (see at least col. 10, lines 43-49).

In regard to the recitation that the reducible acids are reduced “to a predetermined level” as now claimed, this limitation is considered met by Kindig. In Kindig, the reducible acids (i.e. at least the sulfur trioxides) are reduced by combination with a sulfur sorbent (i.e. one type disclosed being magnesium sulfur sorbent (see col. 13, lines 38-58 and col. 14, lines 35-54). Kindig specifically provides that the components of his method that allow for sulfur reduction, including removal of sulfur oxides from the combustion gases with sorbents (see col. 15, lines 1-4) allow for “a particular sulfur reduction target” to be met (see col. 15, lines 4-7). Further, the sulfur reduction target is clearly stated to depend upon such factors as the amount and type of sorbent (see col. 15, lines 8-19). Accordingly, this “reduction target” is considered the “predetermined level” recited in applicant’s claim.

Kindig also discloses micro-staging the first stage fuel combustion where the micro-staging is provided through the use of low NO_x burners (see at least col. 12, lines 40-44), macro-staging the first stage of fuel combustion where the macro-staging is provided through the use of over-fired air (see col. 10, lines 43-46), combinations of the two staging techniques, and the fuel is coal (see col. 1, line 16).

Accordingly, all the limitations presented in claims 1-8 are considered to be anticipated by the disclosure of Kindig.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 17-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,824,441 to Kindig ("Kindig") in view of U.S. Patent No. 4,196,057 to May et al. ("May").

Kindig discloses substantially all of the limitations of the methods recited in claims 17-32 (note the discussion of the teachings of Kindig above which are hereby incorporated into the rejection of claims 17-32).

In regard to claim 17, the acid of concentration of the flue gas is directly related to the acid dew point temperature of the flue gas. This is expressly noted by applicant in applicant's description of the prior art, namely "...as the SO₃ concentration increases, the acid dew point temperature of the flue gas increases." (see applicant's specification, p. 1, lines 16-18). To further support this assertion the examiner also points to May. May discloses a method which provides that "[m]easurement of dew point enables a semi-quantitative determination of the sulfur trioxide concentration in the exhaust or flue gas" (see May, col. 5, lines 30-32 and 38-42). Accordingly, a person of ordinary skill in the art would understand that reduction of the acid concentration of the flue gas necessarily results in the lowering of the acid dew point level of the flue gas. As noted above, Kindig provides for the reduction of sulfur oxides from the effluent of flue gas of a furnace to a "reduction target." Therefore, a person of ordinary skill in the art

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would reasonably understand that obtaining the reduction target of the oxides in the flue gas as specified in Kindig would necessarily result in a corresponding desired dew point level (again see at least May, col. 5, lines 38-42).

In regard to claims 18-24, these limitations are present in Kindig. Note the application of Kindig to claims 2-8 above, which include limitations corresponding to those of claims 18-24.

In regard to claim 25, this claim includes limitations similar to that of claim 17 with the additional method step of “measuring the acid dewpoint of the flue gas.” Kindig possibly does not expressly disclose actively measuring the acid dewpoint of the flue gas.

However, May, as previously noted, clearly provides that the dew point of the exhaust gas is measure to determine a concentration of sulfur trioxide (see May, col. 5, lines 30-32). Further, May provides that the measurement of the dew point also allows for determination of “cold end” corrosion locations (May, col. 5, lines 32-34) and further that the inherent corrosion rate measurement that arises from the dewpoint measurement “indicates the degree of inhibition of an additive such as magnesium and the actual condition at the surface.” (May, col. 5, lines 34-37).

Accordingly, as Kindig clearly provides for the addition of Magnesium as a sorbent in order to achieve sulfur reduction (see Kindig, at least col. 12, lines 54-65 and col. 15, lines 1-7) a person of ordinary skill in the art would desirably modify the method of Kindig to incorporate measuring the acid dewpoint of the flue gas as taught in May to determine the level of corrosion that results from the adding Magnesium to the flue gas (see May, col. 5, lines 30-37).

In regard to claims 26-32, these limitations are present in Kindig. Note the application of Kindig to claims 2-8 above, which include limitations corresponding to those of claims 26-32.

Response to Arguments

6. Applicant's arguments filed 11/02/2006 have been fully considered but they are not persuasive.

Applicant argues that in the limitation of applicant's claims reading "maintaining the reducing environment for a sufficient time period such that reducible acids are reduced to a predetermined level to achieve a desirable acidity concentration in the flue gas" the terms "reducing" and "reduced" should take on a chemical definition such that the terms are narrowly construed to mean the addition of an electron to result in a decrease in valence.

In response, the examiner notes that it is well settled that during patent examination, the USPTO applies to claim verbiage the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the specification. *In re Morris*, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). Further, the ordinary meaning of claim terms may be established by dictionary definitions. *CCS Fitness Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366, 62 USPQ2d 1658, 1662 (Fed. Cir. 2002).

In this case, the term "reduce" is generally defined as "[t]o lessen in extent, amount, number, degree or price." (See Webster's II New Riverside University Dictionary, Riverside Publishing Company, 1988). Further, applicant's specification does not limit the terms "reducing" or "reduce" to be only that of the chemical definition of "reduce". To the contrary, the examiner notes that applicant's own claim 1 uses the term "reducing" in line 1 and line 10 in

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which this term is clearly intended to take on the general definition as recited above, i.e. “to lessen in extent, amount, number, degree or price.” As has been noted above, the terms “reducing” and “reduce” appearing in section b) of claim 1 have likewise been broadly regarded to take on the broad general definition. In doing so, the examiner notes that that the removal of reducible acids (i.e. sulfur trioxide) in Kindig through the use of reaction with a magnesium based sorbent is broadly regarded to meet applicant’s claim language.

In regard to the May reference, applicant argues that this reference does not cure the deficiencies of Kindig regarding the “reducing” and “reduce” limitations appearing in applicant’s claims. However, as the examiner has given these terms their broad definition, as noted above, Kindig is considered to meet these limitations. Therefore, as applicant has not separately argued against the teachings of May, this reference is considered to properly show that for which it has been cited.

Accordingly, applicant’s claims, as broadly construed, do not patentably distinguish applicant’s invention over the prior art of record.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Josiah Cocks whose telephone number is (571) 272-4874. The examiner can normally be reached on M-F 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jcc
January 14, 2007


JOSIAH COCKS
PRIMARY EXAMINER
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